

CLAIMS

1. A loudspeaker comprising a first and second diaphragm and at least one
piezoelectric
actuator coupled by a first end to said first diaphragm and a second end to said
5 second diaphragm to simultaneously excite vibrations in said first and second
diaphragm.

2. The loudspeaker of claim 1, wherein the first and second diaphragms have
essentially equal impedance.

3. The loudspeaker of claim ~~1~~ of 2, wherein the first and second diaphragms are
essentially identical.

4. The loudspeaker of any one of the preceding claims, wherein the diaphragms
15 are flat or curved planes.

5. The loudspeaker of any one of the preceding claims, wherein the diaphragms
are arranged in parallel with a continuous fluid-filled gap between them.

6. The loudspeaker of claim 5, wherein the diaphragms are separated by less
20 than one tenth of their smallest lateral dimension.

7. The loudspeaker of claim 5 or 6, wherein the diaphragms are separated by a
average distance of less than ten millimetres.

8. The loudspeaker of any one of the preceding claims, wherein the actuator
25 comprises an electro-active material.

9. The loudspeaker of claim 8, wherein the actuator is a piezoelectric actuator.

10. The loudspeaker of claim 9, wherein the actuator is a coiled-coil piezoelectric bender.

5 11. The loudspeaker of any one of the preceding claims, wherein the height of the actuator exceeds a minimal spacing between the first and the second diaphragm.

12. The loudspeaker of any one of the preceding claims, mounted by suspending the diaphragms on cables.

10 13. The loudspeaker of any one of claims 1 to 11, mounted by a support element extending between the diaphragms.

7 14. A balanced loudspeaker.

15 15. The loudspeaker of claim 14, wherein said loudspeaker is pistonic.

16. The loudspeaker of claim 14, wherein said loudspeaker is bending-wave.

20 17. The loudspeaker of any one of claims 14 to 16, comprising two diaphragms and at least one actuator for exciting both diaphragms simultaneously.

18. The loudspeaker of claim 17, wherein said actuator is arranged to transfer energy to both diaphragms in essentially equal amounts.